CLAIM OR CLAIMS

WHAT IS CLAIMED IS:

1. An apparatus for displaying a modulated signal representing symbols of

5   information, the modulated signal being demodulated into quadrature

component signals and a symbol clock, to observe distortions comprising:

        means for sampling the quadrature component signals to produce

pseudo-symbols for each symbol in the modulated signal; and

        means for displaying the pseudo-symbols on a quadrature coordinate

10   plane.

2. The apparatus as recited in claim 1 wherein the sampling means

comprises:

        means for generating a sample clock having a period equal to the

15   symbol clock, the sample clock being shifted one-half period in phase with

respect to the symbol clock; and

        means for sampling the quadrature component signals with the sample

clock to produce the pseudo-symbols as pairs of pseudo-symbols about a

symbol sample point for each symbol.

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3. The apparatus as recited in claims 1 or 2 further comprising means for

generating a template for the displaying means representing an ideal

modulated signal.

4. The apparatus as recited in claim 3 further comprising means for determining a distortion index as a function of the number of pseudo-symbols that are outside the template.

5. The apparatus as recited in claim 3 wherein the template comprises a plurality of circles representing clusters of the pseudo-symbols for each symbol of the ideal modulated signal.

6. The apparatus as recited in claim 5 wherein each circle comprises a cluster outline having a diameter that is a function of an outer pair of pseudo-symbols for the corresponding symbol of the ideal modulated signal.

7. The apparatus as recited in claims 1 or 2 wherein the displaying means comprises means for zooming in on individual clusters of pseudo-symbols to observe whether the arrangement of pseudo-symbols in the cluster is similar to the arrangement of clusters on the quadrature coordinate plane.

8. A method of generating a display for a modulated signal representing symbols of information comprising the steps of:

sampling quadrature component signals derived from the modulated signal to produce pseudo-symbols for each symbol of the modulated signal; and

displaying the pseudo-symbols on a quadrature coordinate plane.

9. The method as recited in claim 8 wherein the sampling step comprises the steps of:

generating a sample clock having a period equal to the period of a symbol clock for the modulated signal, the sample clock being shifted one-half period in phase with respect to the symbol clock; and

sampling the quadrature component signals using the sample clock to produce the pseudo-symbols as pairs of pseudo-symbols about a symbol sample point for each symbol.

10. The method as recited in claims 8 or 9 further comprising the steps of:

generating a template representing locations of clusters of the pseudo-random symbols for an ideal modulated signal, each cluster representing a symbol location; and

displaying the template on the quadrature coordinate plane.

11. The method as recited in claim 10 wherein the generating step comprises the step of calculating a diameter of a circle for each location, the template having the circle at each location representing the symbol location for the ideal modulated signal.

12. The method as recited in claim 11 wherein the calculating step comprises the steps of:

determining outer pseudo-symbol pairs for each symbol of the ideal modulated signal; and

calculating the diameter based on the outer pseudo-symbol pairs.

13. The method as recited in claim 10 further comprising the step of determining a quantitative index of distortion in the modulated signal as a function of the number of pseudo-symbols outside the template.

5   14. The method as recited in claims 8 or 9 wherein the displaying step comprises the step of zooming in on individual clusters of pseudo-symbols for the modulated signal to observe whether the arrangement of pseudo-symbols within the cluster is similar to the arrangement of the clusters on the quadrature coordinate plane.

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